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D E C L A R A T I O N

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do solemnly and sincerely declare:

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Naomi YAMAMOTO

JAPAN PATENT OFFICE

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DEVICE CONNECTING SYSTEM AND PRINTING SYSTEM

[Claim]

[Claim 1]

A device connecting system comprising:

a first network device provided with a first network communication means for communication via a network, and a first short range communication means for communicating in short distances for transmitting connection information for establishing a connection between devices via the network through the first short range communication means;

a portable terminal provided with a terminal-use short range communication means corresponding to the first short range communication means, and a terminal-use storage means for storing the connection information which is received from said first network device via the terminal-use short range communication means; and

a second network device provided with a second network communication means for communication with said first network device via the network, a second short range communication means corresponding to the terminal-use short range communication means, and a storage means for storing the connection information which is received from said portable terminal via the second short range communication means.

[Claim 2]

A device connecting method comprising the steps of:

transmitting connection information for establishing a connection between devices via a network through a short range communication means for communicating in short distances, from a first network device on the network to a portable terminal;

storing the connection information in said portable terminal;

transmitting the connection information from said

portable terminal to a second network device on the network through a short range communication means for communicating in short distances; and

storing the connection information in said second network device.

[Claim 3]

A portable terminal to be used in a device connecting system including a first network device provided with a first network communication means for communication via a network and a first short range communication means for communicating in short distances, and a second network device provided with a second network communication means for communication with said first network device via the network and a second short range communication means for communicating in short distances, said portable terminal comprising:

a terminal-use short range communication means corresponding to the first and second short range communication means; and

a terminal-use storage means for storing connection information for establishing a connection between devices via the network, which is received from said first network device via the terminal-use short range communication means,

in which the connection information is transmitted to said second network device via the terminal-use short range communication means.

[Claim 4]

A network device comprising:

a network communication means for communication via a network; and

a short range communication means for communicating with a portable terminal in short distances,

in which connection information for establishing a connection between devices via the network is transmitted to or received from said portable terminal through the short range communication means.

[Claim 5]

A computer readable storage medium storing a device connecting program used for a portable terminal, said program for causing a computer to execute the steps of:

receiving connection information for establishing a connection between devices via a network through a short range communication means for communicating in short distances of a first network device on the network;

storing the connection information; and

transmitting the connection information to a second network device on the network through a terminal-use short range communication means for communicating in short distances.

[Claim 6]

A computer readable storage medium storing a device connecting program used for a network device, said program for causing a computer to execute the processes of:

transmitting connection information for establishing a connection between devices via a network to a portable terminal, or receiving the connection information from said portable terminal through a short range communication means for communicating in short distances.

[Claim 7]

A device connecting system comprising:

a first network device provided with a first network communication means for communication via a network, and a writing means for writing connection information for establishing a connection between devices via the network in a portable storage medium; and

a second network device provided with a second network communication means for communication with said first network device via the network, a reading means for reading the connection information in the portable storage medium, and a storage means for storing the read connection information.

[Claim 8]

A network device comprising:

a network communication means for communication via a network; and

a reading/writing means for reading or writing connection information for establishing a connection between devices via the network in a portable storage medium.

[Claim 9]

A printing system including a data storage device for storing a data, a portable terminal for transferring device information containing connection information for establishing a connection with said data storage device via a network, and a printing device for printing a data transmitted from data storage device via the network on paper, in which

said data storage device comprises a first network communication means for communication via the network, and a first short range communication means for communicating in short distances for transmitting the device information to said portable terminal through the first short range communication means;

said portable terminal comprises a terminal-use short range communication means corresponding to the first short range communication means, and a terminal-use storage means for storing the device information which is received from said data storage device through the terminal-use short range communication means; and

said printing device comprises a second network communication means for communication with said data storage device via the network, a second short range communication means corresponding to the terminal-use short range communication means, and a storage means for storing the device information which is received from said portable terminal through the second short range communication means for receiving a predetermined data from said data storage device with which the connection has been established based

on the device information via the network.

[Claim 10]

A printing system as claimed in claim 9, in which said device information contains an identification code for identifying said data storage device on the network.

[Claim 11]

A printing system as claimed in claim 10, in which said device information contains a password of a user who uses said data storage device.

[Claim 12]

A printing system as claimed in claim 11, in which said device information contains a directory which indicates a location of data stored in said data storage device.

[Claim 13]

A printing system as claimed in claim 9, in which said data storage device is composed of a reading unit for obtaining an image data by reading a document and a storage unit separate from the reading unit for storing the image data obtained by the reading unit,

wherein said device information is information of said storage unit of said data storage device, and

said reading unit comprises a storage means for storing the device information, and said short range communication means.

[Claim 14]

A printing system as claimed in claim 9, in which said short range communication means accepts a short range wireless communication.

[Claim 15]

A printing system as claimed in claim 9, in which said printing device deletes the device information stored in the storage means of said printing device after receiving a predetermined data transmitted from said data storage device with which the connection has been established based on the device information and printing the data on paper.

[Claim 16]

A printing system as claimed in claim 14, in which said printing device deletes the device information stored in the storage means of said printing device after receiving a predetermined data transmitted from said data storage device with which the connection has been established based on the device information and printing the data on paper and waiting for said portable terminal to go out of a range effectively communicable with the said printing device.

[Claim 17]

A printing method comprising the steps of:

transmitting device information containing connection information for establishing a connection with a data storage device via a network from said data storage device on the network to a portable terminal through a short range communication means for communicating in short distances;

storing the device information in said portable terminal;

transmitting the device information from said portable terminal to a printing device on the network through a terminal-use short range communication means for communicating in short distances;

storing the device information in said printing device;

receiving a predetermined data from said data storage device with which the connection has been established based on the device information via the network using said printing device; and

printing the predetermined data on paper.

[Claim 18]

A portable terminal to be used in a printing system including a data storage device having a first network communication means for communication via a network and a first short range communication means for communicating in short distances, and a printing device having a second

network communication means for communication with said first network device via the network and a second short range communication means for communicating in short distances for printing a data transmitted from said data storage device via the network on paper, said portable terminal comprising:

a terminal-use short range communication means corresponding to the first and second short range communication means; and

a terminal-use storage means for storing device information containing connection information for establishing a connection with said data storage device via the network, which is received from said data storage device through the terminal-use short range communication means,

in which the device information is transmitted to said printing device through the terminal-use short range communication means.

[Claim 19]

A data storage device for storing a data comprising:

a network communication means for communication via a network; and

a short range communication means for communicating with a portable terminal in short distances,

in which device information containing connection information for establishing a connection with said data storage device via the network is transmitted to said portable terminal through the short range communication means, and

a predetermined data is transmitted to a printing device with which the connection has been established based on the device information, through the network communication means.

[Claim 20]

A printing device for printing a data on paper comprising:

a network communication means for communication via a

network; and

a short range communication means for communicating with a portable terminal in short distances,

in which device information containing connection information for establishing a connection with a data storage device via a network is received from said portable terminal through the short range communication means, and

a predetermined data from said data storage device with which the connection has been established based on the device information, is received through the network communication means.

[Claim 21]

A computer readable storage medium storing a printing program used for a portable terminal, said program for causing a computer to execute the steps of:

receiving device information containing connection information for establishing a connection with a data storage device via a network, which is transmitted from said data storage device on the network through a short range communication means for communicating in short distances;

storing the device information; and

transmitting the device information to a printing device on the network through a terminal-use short range communication means for communicating in short distances.

[Claim 22]

A computer readable storage medium storing a printing program used for a data storage device, said program for causing a computer to execute the steps of:

transmitting device information containing connection information for establishing a connection with a data storage device via a network, to a portable terminal through a short range communication means for communicating in short distances; and

transmitting a predetermined data to a printing device with which the connection has been established based on the

device information, via the network.

[Claim 23]

A computer readable storage medium storing a printing program used for a printing device, said program for causing a computer to execute the steps of:

receiving device information containing connection information for establishing a connection with a data storage device via a network, from a portable terminal through a short range communication means for communicating in short distances; and

receiving a predetermined data from said data storage device with which the connection has been established based on the device information, via the network.

[Claim 24]

A printing system including a data storage device for storing a data and a printing device for printing a data transmitted from said data storage device via a network, on paper, comprising:

a data storage device provided with a first network communication means for communication via the network, and a writing means for writing device information containing connection information for establishing a connection between devices via the network in a portable storage medium; and

a printing device provided with a second network communication means for communication with said data storage device via the network, a reading means for reading the device information in the portable storage medium, and a storage means for storing the read device information for receiving a predetermined data from said data storage device with which the connection has been established based on the device information.

[Claim 25]

A data storage device for storing a data comprising:

a network communication means for communication via a network; and

a writing means for writing device information containing connection information for establishing a connection with said data storage device via the network, in a portable storage medium,

in which a predetermined data is transmitted to a printing with which the connection has been established based on the device information, through the network communication means.

[Claim 26]

A printing device for printing a data on paper, comprising:

a network communication means for communication via a network; and

a reading means for reading device information containing connection information for establishing a connection with said data storage device via the network, in a portable storage medium,

in which a predetermined data from said data storage device with which the connection has been established based on the device information, is received through the network communication means.

[Description of the Invention]

[0001]

[Field of the Invention]

The invention relates to a device connecting system using a network and a printing system.

[0002]

[Prior Art]

It has become popular in recent years to use network devices such as computers, scanners, copiers, and printers which are configured to be communicable with each other via a network. The user can, for example, transmit data stored in a hard disk of a computer over the network to a printer located at a different place to be printed on paper.

[0003]

However, if the printer is located far from the data transmission side computer, there is a possibility that, after the user transmits a printing job using the computer, someone else can view the printed matter before the user arrives at the printer, which is undesirable in some cases from the standpoint of confidentiality. Furthermore, if the user is far from the computer where the data is stored due to reasons such as a business trip, the user may wish to print the above data on paper on the spot by a printer located nearby.

[0004]

In order to solve these problems, a directive type printer, which specifies a predetermined data stored in a hard disk etc. and receives the data from the computer and prints the data on paper, has been proposed.

[0005]

[Problems to be Solved by the Invention]

However, the directive type printer of the prior art requires setting of parameters such as IP address in order to be connected with the data storage device such as a computer where the data is stored, so that the process is complicated. When the data has to be printed on paper using a plurality of printers, in particular, the user has to perform the abovementioned setting at each printer each time so that it further deteriorate the work efficiency.

[0006]

This invention has been produced for the purpose of solving the problems suffered by the prior art as mentioned above. It is one object of the invention to easily realize the establishment of connection between network devices via a network.

[0007]

It is another object of the invention to easily establish the connection between a printing device and a data storage device located away from the printing device via a

network and to print desired data stored in the distant data storage device on paper by the printer.

[0008]

[Means to Solve the Problems]

The objects of the invention are accomplished by the following means.

[0009]

(1) A device connecting system comprising:

a first network device provided with a first network communication means for communication via a network, and a first short range communication means for communicating in short distances for transmitting connection information for establishing a connection between devices via the network through the first short range communication means;

a portable terminal provided with a terminal-use short range communication means corresponding to the first short range communication means, and a terminal-use storage means for storing the connection information which is received from said first network device via the terminal-use short range communication means; and

a second network device provided with a second network communication means for communication with said first network device via the network, a second short range communication means corresponding to the terminal-use short range communication means, and a storage means for storing the connection information which is received from said portable terminal via the second short range communication means.

[0010]

(2) A device connecting method comprising the steps of:

transmitting connection information for establishing a connection between devices via a network through a short range communication means for communicating in short distances, from a first network device on the network to a portable terminal;

storing the connection information in said portable terminal;

transmitting the connection information from said portable terminal to a second network device on the network through a short range communication means for communicating in short distances; and

storing the connection information in said second network device.

[0011]

(3) A portable terminal to be used in a device connecting system including a first network device provided with a first network communication means for communication via a network and a first short range communication means for communicating in short distances, and a second network device provided with a second network communication means for communication with said first network device via the network and a second short range communication means for communicating in short distances, said portable terminal comprising:

a terminal-use short range communication means corresponding to the first and second short range communication means; and

a terminal-use storage means for storing connection information for establishing a connection between devices via the network, which is received from said first network device via the terminal-use short range communication means,

in which the connection information is transmitted to said second network device via the terminal-use short range communication means.

[0012]

(4) A network device comprising:

a network communication means for communication via a network; and

a short range communication means for communicating with a portable terminal in short distances,

in which connection information for establishing a connection between devices via the network is transmitted to or received from said portable terminal through the short range communication means.

[0013]

(5) A computer readable storage medium storing a device connecting program used for a portable terminal, said program for causing a computer to execute the steps of:

receiving connection information for establishing a connection between devices via a network through a short range communication means for communicating in short distances of a first network device on the network;

storing the connection information; and

transmitting the connection information to a second network device on the network through a terminal-use short range communication means for communicating in short distances.

[0014]

(6) A computer readable storage medium storing a device connecting program used for a network device, said program for causing a computer to execute the processes of:

transmitting connection information for establishing a connection between devices via a network to a portable terminal, or receiving the connection information from said portable terminal through a short range communication means for communicating in short distances.

[0015]

(7) A device connecting system comprising:

a first network device provided with a first network communication means for communication via a network, and a writing means for writing connection information for establishing a connection between devices via the network in a portable storage medium; and

a second network device provided with a second network communication means for communication with said first network

device via the network, a reading means for reading the connection information in the portable storage medium, and a storage means for storing the read connection information.

[0016]

(8) A network device comprising:

a network communication means for communication via a network; and

a reading/writing means for reading or writing connection information for establishing a connection between devices via the network in a portable storage medium.

[0017]

(9) A printing system including a data storage device for storing a data, a portable terminal for transferring device information containing connection information for establishing a connection with said data storage device via a network, and a printing device for printing a data transmitted from data storage device via the network on paper, in which

said data storage device comprises a first network communication means for communication via the network, and a first short range communication means for communicating in short distances for transmitting the device information to said portable terminal through the first short range communication means;

said portable terminal comprises a terminal-use short range communication means corresponding to the first short range communication means, and a terminal-use storage means for storing the device information which is received from said data storage device through the terminal-use short range communication means; and

said printing device comprises a second network communication means for communication with said data storage device via the network, a second short range communication means corresponding to the terminal-use short range communication means, and a storage means for storing the

device information which is received from said portable terminal through the second short range communication means for receiving a predetermined data from said data storage device with which the connection has been established based on the device information via the network.

[0018]

(10) A printing system as claimed in the above (9), in which said device information contains an identification code for identifying said data storage device on the network.

[0019]

(11) A printing system as claimed in the above (10), in which said device information contains a password of a user who uses said data storage device.

[0020]

(12) A printing system as claimed in the above (11), in which said device information contains a directory which indicates a location of data stored in said data storage device.

[0021]

(13) A printing system as claimed in the above (9), in which said data storage device is composed of a reading unit for obtaining an image data by reading a document and a storage unit separate from the reading unit for storing the image data obtained by the reading unit,

wherein said device information is information of said storage unit of said data storage device, and

said reading unit comprises a storage means for storing the device information, and said short range communication means.

[0022]

(14) A printing system as claimed in the above (9), in which said short range communication means accepts a short range wireless communication.

[0023]

(15) A printing system as claimed in the above (9),

in which said printing device deletes the device information stored in the storage means of said printing device after receiving a predetermined data transmitted from said data storage device with which the connection has been established based on the device information and printing the data on paper.

[0024]

(16) A printing system as claimed in the above (14), in which

said printing device deletes the device information stored in the storage means of said printing device after receiving a predetermined data transmitted from said data storage device with which the connection has been established based on the device information and printing the data on paper and waiting for said portable terminal to go out of a range effectively communicable with the said printing device.

[0025]

(17) A printing method comprising the steps of:

transmitting device information containing connection information for establishing a connection with a data storage device via a network from said data storage device on the network to a portable terminal through a short range communication means for communicating in short distances;

storing the device information in said portable terminal;

transmitting the device information from said portable terminal to a printing device on the network through a terminal-use short range communication means for communicating in short distances;

storing the device information in said printing device;

receiving a predetermined data from said data storage device with which the connection has been established based on the device information via the network using said printing device; and

printing the predetermined data on paper.

[0026]

(18) A portable terminal to be used in a printing system including a data storage device having a first network communication means for communication via a network and a first short range communication means for communicating in short distances, and a printing device having a second network communication means for communication with said first network device via the network and a second short range communication means for communicating in short distances for printing a data transmitted from said data storage device via the network on paper, said portable terminal comprising:

a terminal-use short range communication means corresponding to the first and second short range communication means; and

a terminal-use storage means for storing device information containing connection information for establishing a connection with said data storage device via the network, which is received from said data storage device through the terminal-use short range communication means,

in which the device information is transmitted to said printing device through the terminal-use short range communication means.

[0027]

(19) A data storage device for storing a data comprising:

a network communication means for communication via a network; and

a short range communication means for communicating with a portable terminal in short distances,

in which device information containing connection information for establishing a connection with said data storage device via the network is transmitted to said portable terminal through the short range communication means, and

a predetermined data is transmitted to a printing device with which the connection has been established based on the device information, through the network communication means.

[0028]

(20) A printing device for printing a data on paper comprising:

a network communication means for communication via a network; and

a short range communication means for communicating with a portable terminal in short distances,

in which device information containing connection information for establishing a connection with a data storage device via a network is received from said portable terminal through the short range communication means, and

a predetermined data from said data storage device with which the connection has been established based on the device information, is received through the network communication means.

[0029]

(21) A computer readable storage medium storing a printing program used for a portable terminal, said program for causing a computer to execute the steps of:

receiving device information containing connection information for establishing a connection with a data storage device via a network, which is transmitted from said data storage device on the network through a short range communication means for communicating in short distances;

storing the device information; and

transmitting the device information to a printing device on the network through a terminal-use short range communication means for communicating in short distances.

[0030]

(22) A computer readable storage medium storing a printing program used for a data storage device, said program

for causing a computer to execute the steps of:

transmitting device information containing connection information for establishing a connection with a data storage device via a network, to a portable terminal through a short range communication means for communicating in short distances; and

transmitting a predetermined data to a printing device with which the connection has been established based on the device information, via the network.

[0031]

(23) A computer readable storage medium storing a printing program used for a printing device, said program for causing a computer to execute the steps of:

receiving device information containing connection information for establishing a connection with a data storage device via a network, from a portable terminal through a short range communication means for communicating in short distances; and

receiving a predetermined data from said data storage device with which the connection has been established based on the device information, via the network.

[0032]

(24) A printing system including a data storage device for storing a data and a printing device for printing a data transmitted from said data storage device via a network, on paper, comprising:

a data storage device provided with a first network communication means for communication via the network, and a writing means for writing device information containing connection information for establishing a connection between devices via the network in a portable storage medium; and

a printing device provided with a second network communication means for communication with said data storage device via the network, a reading means for reading the device information in the portable storage medium, and a

storage means for storing the read device information for receiving a predetermined data from said data storage device with which the connection has been established based on the device information.

[0033]

(25) A data storage device for storing a data comprising:

a network communication means for communication via a network; and

a writing means for writing device information containing connection information for establishing a connection with said data storage device via the network, in a portable storage medium,

in which a predetermined data is transmitted to a printing with which the connection has been established based on the device information, through the network communication means.

[0034]

(26) A printing device for printing a data on paper, comprising:

a network communication means for communication via a network; and

a reading means for reading device information containing connection information for establishing a connection with said data storage device via the network, in a portable storage medium,

in which a predetermined data from said data storage device with which the connection has been established based on the device information, is received through the network communication means.

[0035]

[Working Example]

The embodiments of this invention will be described below using the accompanying drawings.

[0036]

(Embodiment 1)

Fig. 1 is a block diagram illustrating the overall constitution of a printing system according to Embodiment 1 of the present invention.

[0037]

The printing system includes a scanner 10 having a function as a data storage device, a printer 20 and a portable terminal 40. The scanner 10 and the printer 20 are constituted to be able to communicate with each other via a network 30. The kinds and the number of devices on the network 30 are actually not limited to those shown in Fig. 1. The network 30 can be, for example, a LAN or a WAN, which consists of LANs connected together, using Ethernet®, Token Ring, FDDI (Fiber Distributed Data Interface), etc.

[0038]

Let us assume that a user-A carries a portable terminal 40 such as a cellular phone or a PHS®. The portable terminal according to the present Embodiment is not limited to them, but can be a PDA, notebook type computer, electronic notepads, etc., in other words, any terminal that can be transported by hand.

[0039]

The portable terminal 40 is mutually capable of performing short distance communications with the scanner 10 and the printer 20. In this specification, the short distance communications include short distance wireless communications and short distance wired communications without recourse to the network 30. For example, in case of short distance wireless communications, the communication distance is preferably less than 100 m, or more preferably less than 10 m. More specifically, such standards as Bluetooth®, IEEE 802.11, HomeRF, and IrDA are applicable to short distance wireless communications.

[0040]

The constitutions of each device as discussed above

will be described below in details. In order to avoid duplications, the same function, which exists in various devices, will be described in the first device only and the description for the same will not be repeated for others.

[0041]

Fig. 2 is a block diagram illustrating an example of the constitution of a scanner.

[0042]

The scanner 10 has a CPU 11, a ROM 12, a storage unit 13, an operating panel unit 14, an image reading unit 15, a network interface 16, a local interface 17 and a bus 18 for exchanging signals between the above parts as shown in Fig. 2.

[0043]

The CPU 11 performs various control and arithmetic processes. The ROM 12 stores various programs. The storage unit 13 stores various data such as image data, and is used as a working area by temporarily storing data as well. The storage unit 13 consists of, e.g., a memory and a hard disk.

[0044]

The operating panel unit 14, for example, consists of an operating unit for the user to conduct various operating instructions and a display unit for various displays. The image reading unit 15 generates image data by reading a document.

[0045]

The network interface 16 is an interface for the scanner 10 to communicate with other network device such as printer 20 via the network 30.

[0046]

The local interface 17 is an interface for the portable terminal 40 to communicate locally, i.e., within short distances, directly with other device. Specifically, the local interface 17 according to the present Embodiment is preferably a wireless communication type interface in

conformance with such standards as Bluetooth and IrDA in which the communication distance is limited more.

[0047]

Fig. 3 is a block diagram illustrating an example of the constitution of a printer.

[0048]

The printer 20 includes a CPU 21, a ROM 22, a storage unit 23, an operating panel unit 24, a printing unit 25, a network interface 26, a local interface 27 and a bus 28 as shown in Fig. 3.

[0049]

The printing unit 25 prints various data on paper. The printer 20 receives data transmitted by other network device such as the scanner 10 via the network 30 and prints the data on paper by the printing unit 25.

[0050]

Fig. 4 is a block diagram illustrating an example of the constitution of a portable terminal.

[0051]

The portable terminal 40 includes a CPU 41, a ROM 42, a storage unit 43, input keys 44, a microphone 45, a display 46, a speaker 47, a local interface 48, a wireless device 49, and a bus 50 as shown in Fig. 4.

[0052]

The storage unit 43 stores various data such as device information concerning the scanner 10. The input keys 44 are used for making various inputs and the microphone 45 is used for making voice input. The display 46 is for various displays and the speaker 47 is for generating various voice outputs.

[0053]

The local interface 48 corresponds with the local interfaces 17 and 27. Specifically, the local interface 48 is an interface for communicating with the scanner 10 and the printer 20 locally, i.e., for communicating directly with

other device within short distances.

[0054]

The wireless device 49 is a device for exchanging signals with external device via a mobile telecommunication network using electromagnetic waves of a prescribed frequency band.

[0055]

If a portable terminal that does not have the wireless communication function via the mobile telecommunication network, it does not need the above wireless device. Eventually, the necessary composing elements of a portable terminal which can implement the present invention are as in Fig. 5 regardless of whether it has the above-mentioned wireless communication function or not. Thus, a portable terminal 60 has to have at least a CPU 61, a ROM 62, a storage unit 63, a local interface 64, and a bus 65 as shown in Fig. 5.

[0056]

The operation of the printing system will be described referring to the sequence chart shown in Fig. 6.

[0057]

First, at the step S101, the scanner 10 reads the document and stores the image data.

[0058]

At the step S102, the portable terminal 40 transmits to the scanner 10 via the network 30 a signal requesting the device information of the scanner 10 including the connection information required for establishing connection with the scanner 10.

[0059]

At the step S103, the scanner 10 transmits the device information to the portable terminal 40 and the device information is stored by the portable terminal 40.

[0060]

At the step S104, after the user-A, who is carrying

the portable terminal 40, moves to the vicinity of the printer 20 as shown by alternate long and two short dashes line in Fig. 1, the user-A operates the portable terminal 40 to transmit the device information to the printer 20, and the device information is stored in the printer 20.

[0061]

At the step S105, the printer 20 transmits a connection request to the scanner 10 via the network 30 based on the connection information of the device information.

[0062]

At the step S106, the scanner 10 transmits the connection response to the printer 20 via the network 30. Thus, the connection between the scanner 10 and the printer 20 is established.

[0063]

At the step S107, the printer 20 transmits the device information to the scanner 10 and an image data information request for specifying the image data stored at the scanner 10. The scanner 10 authenticates the image data information request from the printer 20.

[0064]

At the step S108, the scanner 10 transmits the image data information to the printer 20 and the image data information is stored into the printer 20.

[0065]

At the step S109, the printer 20 transmits to the scanner 10 the request of a predetermined image data selected by the user-A from the image data information.

[0066]

At the step S110, the scanner 10 transmits the predetermined image data to the printer 20.

[0067]

The printer 20 prints the predetermined image data on paper (S111). When the user-A, who is carrying the portable terminal 40, later goes out of a predetermined range of the

printer 20, the device information in the printer 20 is deleted (S112).

[0068]

The device information will be described below referring to Fig. 7.

[0069]

Fig. 7 shows an example of the device information of the scanner 10 when FTP (File Transfer Protocol) is applied to the transmission of the image data transfer.

[0070]

The device information contains information about the scanner 10 such as an IP address, a login name, a password, and a directory name.

[0071]

The connection information includes at least an identification code for identifying the scanner 10 on the network 30. The identification code is the IP address in the present Embodiment. The login name and the password correspond to the user-A who uses the scanner 10. The directory indicates the location of the data stored at the storage unit 13 of the scanner 10. In Fig. 7, it is indicated that the user-A has stored the image data at a directory called PRINTER in the storage unit 13 of the scanner 10.

[0072]

The protocol for transmission of the data in the network 30 is not limited to the FTP but rather protocols such as LPR (Line Printer Remote) and IFAX (Internet FAX) can be used. When the IFAX is applied to the data transmission, the identification code is e-mail address.

[0073]

The operation of the scanner 10 will be described below referring to Fig. 8. The flow chart of Fig. 8 is stored as a control program in the ROM 12 and is executed by the CPU 11.

[0074]

At the step S201, the document is read by the image reading unit 15 and the image data obtained is stored at the storage unit 13.

[0075]

At the step S202, the scanner waits for the receipt of request of device information of the scanner 10 which contains the connection information required for establishing the connection between the portable terminal 40 and the scanner 10 via the local interface 17 and the network 30.

[0076]

At the step 203, the scanner transmits the device information to the portable terminal 40, when receiving the device information request (step S202: YES).

[0077]

Incidentally, a number unique to the portable terminal 40 (e.g., telephone number) and the login name are stored correlated to each other at the storage unit 13 of the scanner 10 in advance. Furthermore, in response to the device information request from the portable terminal 40, the device information including the number unique to the portable terminal 40 is additionally transmitted to the scanner 10. Therefore, the scanner 10 is capable of transmitting the device information corresponding to the login name related to the number unique to the portable terminal 40 to the portable terminal 40. It is also possible to transmit the device information from the scanner 10 to the portable terminal 40 by instruction using the operating panel unit 14 of the scanner 10 instead of making a device information request to the scanner 10 from the portable terminal 40. In this case, it is easy to add the login name to the device information using the operating panel unit 14 of the scanner 10.

[0078]

At the step S204, the scanner transmits the connection

response to the printer 20 in response to the connection request from the printer 20 via the network 30 based on the connection information contained in the device information. Thus, the connection between the scanner 10 and the printer 20 is established via the network 30.

[0079]

At the step S205, the scanner waits for the receipt of the image data information request from the printer 20. The image data information request is conducted by the transmission of the device information from the printer 20 to the scanner 10 via the network 30. Incidentally, the image data information is information such as a list of file names of the image data stored in the scanner 10.

[0080]

At the step S206, authentication is performed by collating the device information received from the printer 20 and the device information stored in the scanner 10, when the image data information request is received (step S205: YES). When it succeeds to authenticate (step S206: YES), the step S207 is executed. If it fails to authenticate (step S206: No), the operation is terminated. Alternatively, it is allowable to transmit a predetermined warning, etc., to the printer 20 or the portable terminal 40. Moreover, it may be possible to skip the authentication.

[0081]

The steps S204 through S206 can be executed as an integral process by transmitting the device information containing the connection information from the printer 20 to the scanner 10 via the network 30.

[0082]

At the step S207, the image data information is transmitted to the printer 20 via the network 30.

[0083]

At the step S208, the scanner waits for the receipt of the request of predetermined image data selected by the user-

A from the image data information from the printer 20. The predetermined image data can be consisted of a plurality of files.

[0084]

At the step S209, when the request of the predetermined image data is received (step S208: YES), the above predetermined image data is transmitted to the printer 20 via the network 30. It is also possible to obtain the specification information (printing resolution, etc.) of the printer 20 from the printer 20 via the network 30, prepare a printing job for printing the image data based on the specification information, and transmit the printing job to the printer 20.

[0085]

Referring to Fig. 9, the operation of the portable terminal 40 will be described. The flowchart of Fig. 9 is stored in the ROM 42 as a control program, and is executed by the CPU 41.

[0086]

First, at the step S301, based on the user-A's operation on the input keys 44 of the portable terminal 40, the portable terminal 40 transmits the device information request of the scanner 10 to the scanner 10 via the local interface 48.

[0087]

At the step S302, the portable terminal waits for the reception of the device information from the scanner 10 via the local interface 48.

[0088]

At the step S303, the received device information is stored into the storage unit 43.

[0089]

At the step S304, after the user-A, who is carrying the portable terminal 40, moves to the vicinity of the printer 20 as shown by alternate long and two short dashes

line in Fig. 1, the portable terminal waits for the user-A to enter an instruction by operating the input keys 44 of the portable terminal 40 for transmitting the device information to the printer 20.

[0090]

At the step S305, when it is instructed to transmit the device information (step S304: YES), the portable terminal transmits the device information to the printer 20 via the local interface 48.

[0091]

The transmission of the device information to the printer 20 is not limited to the constitution where it is performed by the user-A operating the input keys 44 of the portable terminal 40. For example, it is possible to constitute the system in such a way that the device information is automatically transmitted to the printer 20 when the portable terminal 40 enters into the range communicable with the printer 20. The method of judging whether the portable terminal 40 is within the range communicable with the printer 20 will be described later.

[0092]

The operation of the printer 20 will be described referring to Fig. 10. The flowchart as shown in Fig. 10 is stored, for example, as a control program in the ROM 22, and is executed by the CPU 21.

[0093]

First, at the step S401, the printer waits for the reception of the device information from the portable terminal 40 via local interface 27.

[0094]

At the step S402, when the device information is received (step S401: YES), the received device information is stored in the storage unit 23.

[0095]

At the step S403, the printer receives the connection

response from the scanner 10 in response to the connection request to the scanner 10 via the network 30 based on the connection information contained in the device information. As a result, the connection between the scanner 10 and the printer 20 via the network 30 is established.

[0096]

At the step S404, the image data information request is transmitted to the scanner 10 via the network 30. The image data information is information such as a name list of image data files as mentioned before. The image data information is information at the directory named PRINTER as shown in Fig. 7 in case of the present Embodiment.

[0097]

The steps S403 and S404 can be executed as an integral process by transmitting the device information containing the connection information from the printer 20 to the scanner 10 via the network 30.

[0098]

At the step S405, the printer waits for the reception of the image data information from the scanner 10 via the network 30.

[0099]

At the step 406, when the image data information is received (step S405: YES), the received image data information is stored into the storage unit 23.

[0100]

At the step S407, the request for predetermined image data selected from the image data information by the user-A operating the operating panel unit 24 is transmitted to the scanner 10 via the network 30.

[0101]

At the step S408, the printer waits for the reception of the predetermined image data from the scanner 10 via network 30.

[0102]

At the step S409, when the predetermined image data is received (step S408: YES), the said printing unit 25 prints the predetermined image data on paper when the predetermined image data is received (step S408: YES).

[0103]

At the step S410, after the printing of the above predetermined image data, the printer waits for the portable terminal 40 to go out of the range effectively communicable with the printer 20.

[0104]

Incidentally, the judgment on whether the portable terminal 40 is within the range effectively communicable with the printer 20 is based on the connection check wherein the printer 20 tries connection with the portable terminal 40 at a constant time interval and severs the connection as soon as it establishes the connection. In other words, when the printer 20 is no longer capable of connecting with the portable terminal 40 through the local interface 27, the portable terminal 40 is judged to be out of the range effectively communicable with the printer 20. It is also possible to make the judgment of whether the portable terminal is within the effectively communicable range, based on the connection check made by the portable terminal 40 as to the printer 20 instead of the connection check made by the printer 20 as to the portable terminal 40.

[0105]

At the step S411, when the portable terminal 40 is out of the range effectively communicable with the printer 20 (step S410: YES), the printer 20 deletes the device information of the scanner 10 stored in the storage unit 23.

[0106]

According to Embodiment 1, the establishment of connection between the scanner 10 and the printer 20 can be easily realized via the network 30 using the portable terminal 40 that stores the device information.

[0107]

Therefore, by establishing the connection between the printer 20 located close to the user and the scanner 10 located at a place distant from the printer 20, it is possible to easily make the printer 20 print any desired image data stored in the distant scanner 10. It is less likely for the printed result being exposed to a third party, so that it is more desirable from the security standpoint. Furthermore, if the user is substantially far from the scanner 10 due to reasons such as a business trip, it is convenient to be able to print the above image data on paper on the spot by a nearby printer. Moreover, the data volume of the device information is less than the image data that is being transmitted over the network 30 so that the burden on the portable terminal 40 is substantially limited.

[0108]

In addition, since the device information of the scanner 10 stored in the printer 20 is deleted when the portable 40 moves away from the printer 20 a prescribed distance, it is possible, for example, to prevent a third party from using the device information so that it is more desirable from the security standpoint. On the other hand, if the portable terminal 40 stays within a certain distance from the printer 20, the device information is not deleted so that a desired number of copies of image data can be printed on paper. Moreover, it is convenient as the deletion of the device information is automatically done.

[0109]

(Embodiment 2)

Fig. 11 is a block diagram illustrating the overall constitution of a printing system according to Embodiment 2 of the present invention.

[0110]

Embodiment 2 is different from Embodiment 1 using the portable terminal 40 on the point that a memory card 70 is

used to establish the connection between a scanner 10a and a printer 20a via the network 30. However, the two are generally identical on all other points, so that the description will focus on the differences and the descriptions on commonalities will be fittingly omitted.

[0111]

This printing system includes the scanner 10a that has a capability as a data storage device, the printer 20a, and the memory card 70. The scanner 10a and the printer 20a are constituted to be communicable with each other via the network 30.

[0112]

For example, the user-A carries the memory card 70. However, any portable memory media, e.g., a magnetic memory medium such as a flexible disk or ZIP, or an opto-magnetic memory medium such as MO can be used in the present invention instead of the memory card 70 which is a storage medium using a flash memory.

[0113]

Various data in the memory card 70 can be read or various data can be written on the memory card 70 when the memory card 70 is attached to the scanner 10a or the printer 20a.

[0114]

Fig. 12 is a block diagram illustrating an example of the constitution of the scanner and Fig. 13 is a block diagram illustrating an example of the constitution of the printer.

[0115]

The scanner 10a is different from the scanner 10 of Embodiment 1 in that it has a memory card slot 17a instead of the local interface 17. The memory card slot 17a is constituted to accept the insertion of the memory card 70 for writing the device information of the scanner 10a on the memory card 70.

[0116]

The printer 20a is different from the printer 20 of Embodiment 1 in that it has a memory card slot 27a instead of the local interface 27. The memory card slot 27a is constituted to accept the insertion of the memory card 70 for reading the device information of the scanner 10a from the memory card 70. The device information is stored into the storage unit 23 of the printer 20a.

[0117]

The operation of the printing system is described referring to the sequence chart shown in Fig. 14.

[0118]

At the step S501, the scanner 10a reads the document, and stores the image data.

[0119]

At the step S502, the scanner 10a writes on the memory card 70 inserted into the memory card slot 17a the device information of the scanner 10a containing the connection information required for establishing a connection with the scanner 10a via the network 30 based on the instruction provided by the user-A using the operating panel unit 14.

[0120]

At the sep S503, after the user-A, who is carrying the memory card 70, moves to the vicinity of the printer 20a as shown by alternate long and two short dashes line in Fig. 11, the printer 20a reads the device information from the memory card 70 inserted into the memory card slot 27a based on the instruction provided by the user-A using the operating panel unit 24. The device information is stored into the printer 20a.

[0121]

Since the steps S504 through S510 are identical to the steps S105 through S111 of Embodiment 1 shown in Fig. 6, their descriptions will not be repeated here.

[0122]

In Embodiment 2, after printing the predetermined image data on paper, the printer 20a deletes the device information stored in the printer 20a (S511).

[0123]

Embodiment 2 describes that the device information stored in the printer 20a is deleted at the end of one job of printing a predetermined image data. However, the device information may be deleted at the end of a plurality of printing jobs. In such a case, it is preferable that the printer 20a should ask the user whether the next print job exists by means of a display of the operating panel unit 24.

[0124]

Thus, in Embodiment 2, it is possible to easily realize the establishment of connection between the scanner 10a and the printer 20a via the network 30 by means of the memory card 70 that stores the device information. This means that Embodiment 2 can provide an approximately equal effect as Embodiment 1.

[0125]

The present invention is not limited to the particular embodiments shown and described above but may be variously changed and modified within claims.

[0126]

For example, although a constitution using a wireless type interface as a local interface was described in Embodiment 1 mentioned above, the present invention is not limited to this, and also may use a wired communication type interface such as the one using cables.

[0127]

Furthermore, although a constitution was described in Embodiment 1 mentioned above where the device information stored in the printer 20 is deleted when the portable terminal 40 leaves the range effectively communicable with the printer 20, it is also possible to adopt a constitution of deleting the device information after printing the desired

image data on paper in Embodiment 1, similar to Embodiment 2.
[0128]

Moreover, although it was described in Embodiments mentioned above that the image data transmitted via the network 30 is to be stored in the storage unit of the scanner which functions as data storage device, the present invention is not limited by such a constitution. More specifically, the data storage device according to the present invention may be composed of a reading device that obtains image data by reading the document and a storage device that is provided separately from the reading device and stores image data obtained by the reading device. For example, the above reading device can be a scanner without a storage unit such as a hard disk, and the above data storage device is, for example, a file server. The scanner, as a reading device, can include a local interface or a memory card slot. In this case, if the scanner stores the device information of the file server when the image data read by the scanner is stored into the file server, the scanner can output the device information of the file server to the portable terminal or the memory card.

[0129]

Although a scanner was exemplified as the data storage device and a printer as the printing device in Embodiments mentioned above, the present invention is not limited to such constitutions. It is also possible to use, for example, a multifunction digital copying machine, which is sometimes called MFP (multifunction peripheral), a facsimile, a personal computer, a workstation, etc., as the data storage device. A digital copying machine, a facsimile, etc., can be used as the printing device. For example, the present invention can be applied to a printing system in which the image data is transmitted from a computer via the network to a printer to be printed on paper.

[0130]

Although a constitution was described in Embodiments mentioned above where a connection is established via a network by transmitting the device information of a scanner having a function as the data storage device to a printer via a portable terminal or a portable storage medium, the present invention is not limited to such constitutions. Conversely, it is also possible to adopt a constitution of establishing a connection by transmitting the printer's device information to a scanner or a computer via a portable terminal, etc.

[0131]

Moreover, although a printing system was described in Embodiments mentioned above where the image data is transmitted from the data storage device via a network to the printing device and printed on paper by the printing device, the present invention is not limited to such a printing system. The present invention can be applied to a device connecting system for realizing the establishment of connection between two network devices constituted to be able to communicate via a network, for exchanging data between the network devices. The present invention can be applied to a device connecting system for realizing the establishment of connection between two network devices to exchange data between two network devices constituted to be able to communicate via a network. Therefore, if the connection information such as IP addresses is mutually not known between the network devices of two, it is possible to easily realize the establishment of connection between the network devices by means of a portable terminal or a portable storage medium in which the device information is stored. This makes it possible to exchange various signals such as data or instructions in either direction between one network device located near the user and the other network device far from the user if the connection between the network devices is established.

[0132]

In the abovementioned device connecting system, arbitrary devices such as scanners, digital copying machines, facsimiles, computers, workstations, printers, etc., can be combined, regardless on the transmission side or on the reception side, as the devices connected via the network. Furthermore, connecting devices such as modems, terminal adapters, bridges, and routers, can be included as the network device.

[0133]

The data to be transmitted over the network is not limited to image data but rather includes arbitrary data such as document data, voice data, and software. According to the present invention, it can be, therefore, applied to a case where device drivers such as a printer driver used for device such as a printer are to be installed on a computer, which is away from a device such as a printer, via a network.

[0134]

The printing system, each means for control or arithmetic process in the device connecting systems, the printing methods, and device connecting system according to the present invention are applicable to dedicated hardware circuits, or computers where the programs are installed. If the present invention is realized by means of computers in which the programs are installed, the program for operating a computer can be provided by a computer readable storage medium, for example, flexible disk, CD-ROM, etc. In this case, the program stored on the computer readable storage medium is normally transferred to hard disks to be stored. The program can be provided as an application software separately or can be incorporated with a software of a computer as one function of the computer in advance.

[0135]

[Effects of the Invention]

According to the invention described above, it is possible to easily realize the establishment of connection

between the devices via the network by means of the portable terminal or the portable storage medium in which the device information including the connection information is stored.

[0136]

Therefore, it is possible to easily establish the connection between the printing device and the data storage device located at a place distant from the printing device via the network, and easily make the printing device print any desired data stored in the distant data storage device on paper. It is less likely for the printed result being exposed to a third party, so that it is more desirable from the security standpoint. Furthermore, if the user is substantially far from the data storage device due to reasons such as a business trip, it is convenient to be able to print the above data on paper on the spot by the nearby printing device.

[0137]

In addition, if a constitution of automatically deleting the device information stored in the printing device at a predetermined time after the printing is applied, it is convenient to prevent a third party from using the device information so that it is more desirable from the security standpoint.

[Brief Explanation of the Drawings]

[Fig. 1]

Fig. 1 is a block diagram illustrating the overall constitution of a printing system according to Embodiment 1 of the present invention.

[Fig. 2]

Fig. 2 is a block diagram illustrating an example of the constitution of a scanner.

[Fig. 3]

Fig. 3 is a block diagram illustrating an example of the constitution of a printer.

[Fig. 4]

Fig. 4 is a block diagram illustrating an example of the constitution of a portable terminal.

[Fig. 5]

Fig. 5 is a block diagram illustrating another example of the constitution of the portable terminal.

[Fig. 6]

Fig. 6 is a sequence chart for explaining the operation of the printing system.

[Fig. 7]

Fig. 7 is a drawing illustrating an example of device information.

[Fig. 8]

Fig. 8 is a flowchart for explaining the operation of the scanner.

[Fig. 9]

Fig. 9 is a flowchart for explaining the operation of the portable terminal.

[Fig. 10]

Fig. 10 is a flowchart for explaining the operation of the printer.

[Fig. 11]

Fig. 11 is a block diagram illustrating the overall constitution of a printing system according to Embodiment 2 of the present invention.

[Fig. 12]

Fig. 12 is a block diagram illustrating an example of the constitution of a scanner.

[Fig. 13]

Fig. 13 is a block diagram illustrating an example of the constitution of a printer.

[Fig. 14]

Fig. 14 is a sequence chart for explaining the operation of the printing system.

[Explanation of reference signs in Drawings]

10, 10a ... Scanner (data storage device, first network

device),
16 ... Network interface (first network communication means),
17 ... Local interface (first short range communication means),
17a ... Memory card slot (writing means),
20, 20a ... Printer (printing device, second network device),
23 ... Storage unit (storage means),
26 ... Network interface (second network communication means),
27 ... Local interface (second short range communication means),
27a ... Memory card slot (reading means),
30 ... Network,
40, 60 ... Portable terminal,
43, 63 ... Storage unit (terminal-use storage means),
48 ... Local interface (terminal-use short range communication means),
70 ... Memory card (portable storage medium).

[Document's Name] Abstract

[ABSTRACT]

[PURPOSE]

To easily establish a connection between a printing device and a data storage device located at a place distant from the printing device via a network, and print a desired data stored in the distant data storage device on paper using the printing device.

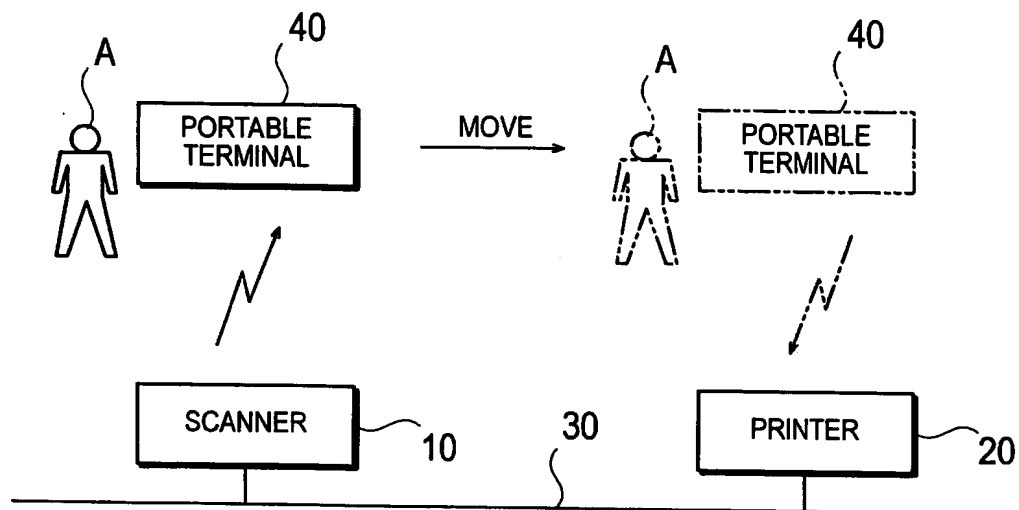
[CONSTITUTION]

A scanner 10 on a network 30 transmits device information of the scanner 10 containing connection information to a portable terminal 40 via a local interface. After a user-A, who is carrying the portable terminal 40, moves to the vicinity of a printer 20, the portable terminal 40 transmits the above device information to the printer 20 via a local interface. The printer 20 receives a predetermined data from the scanner 10 with which a connection has been established based on the device information.

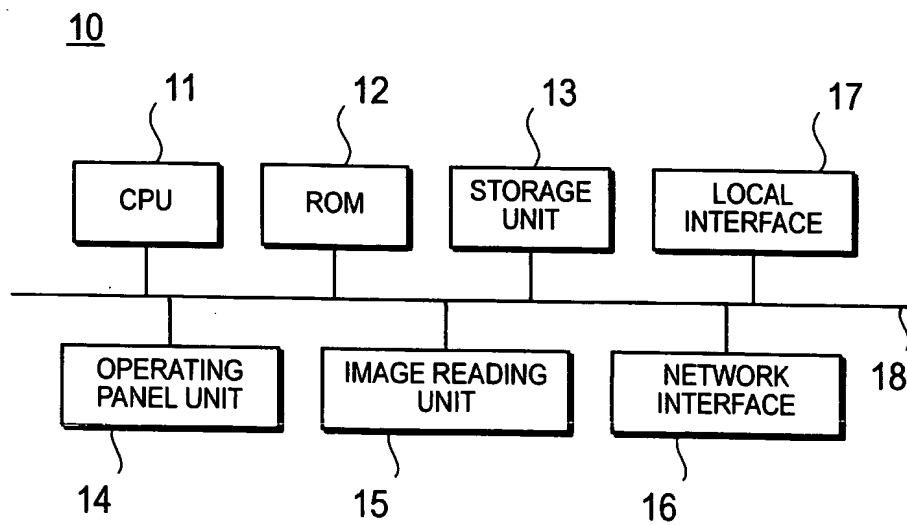
[Selected Figure] Fig. 1

[Document's Name] Figures

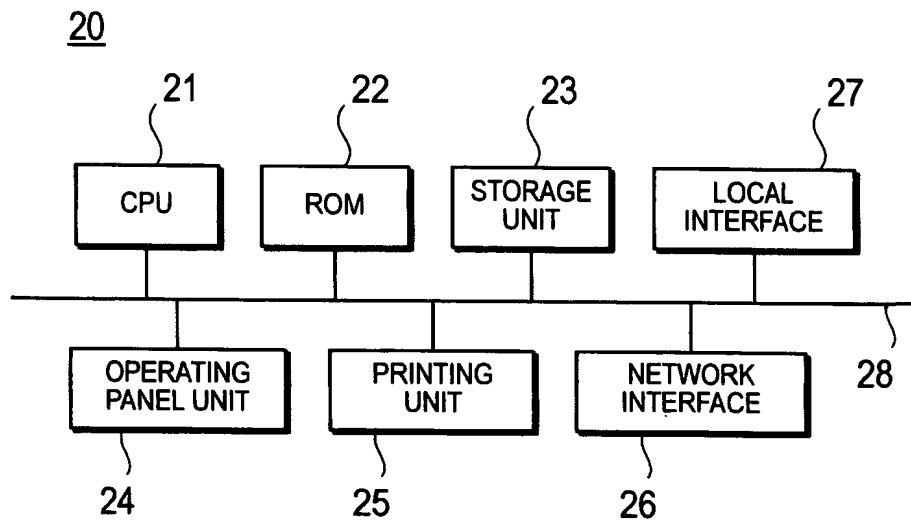
[Fig. 1]



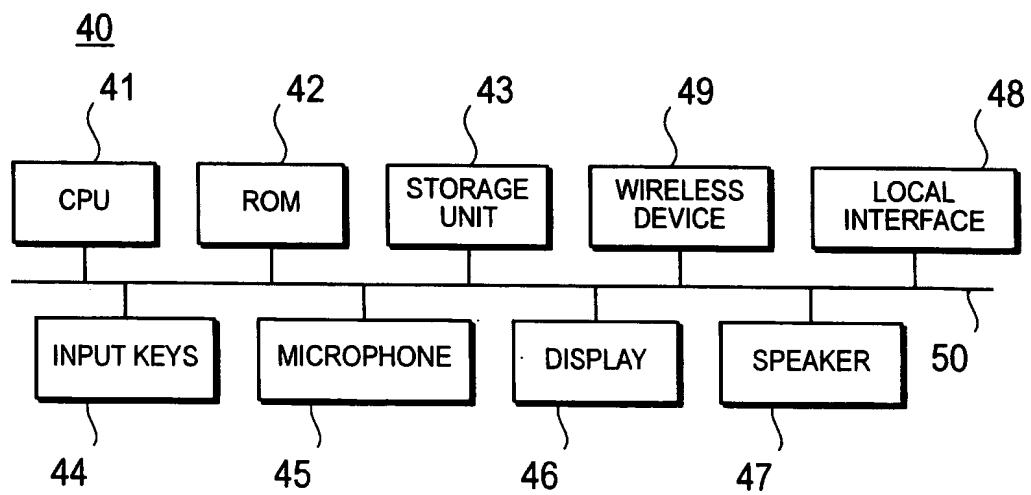
[Fig. 2]



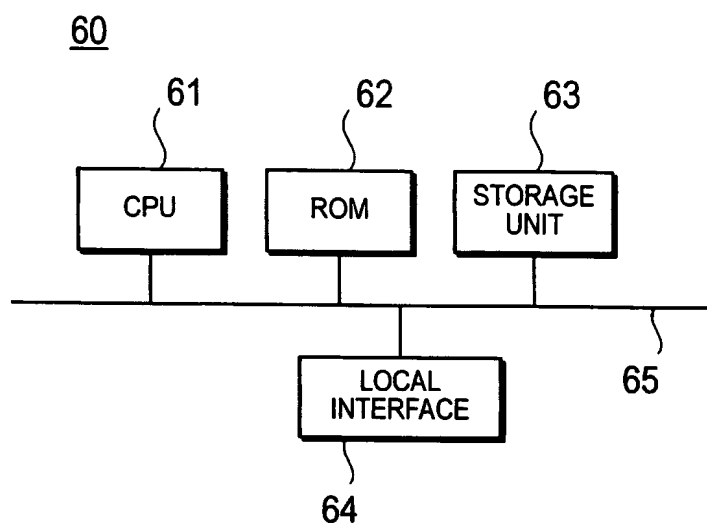
[Fig. 3]



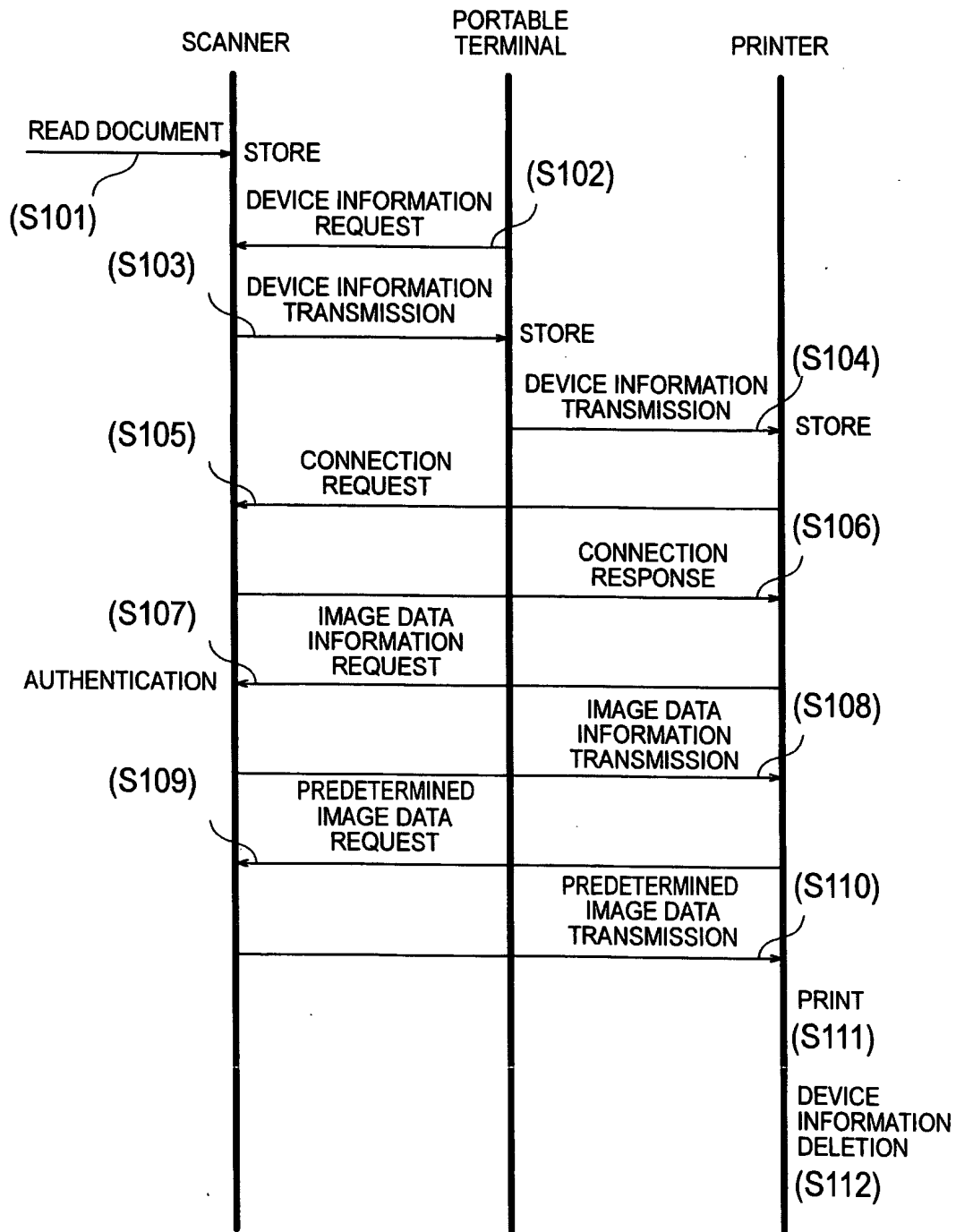
[Fig. 4]



[Fig. 5]



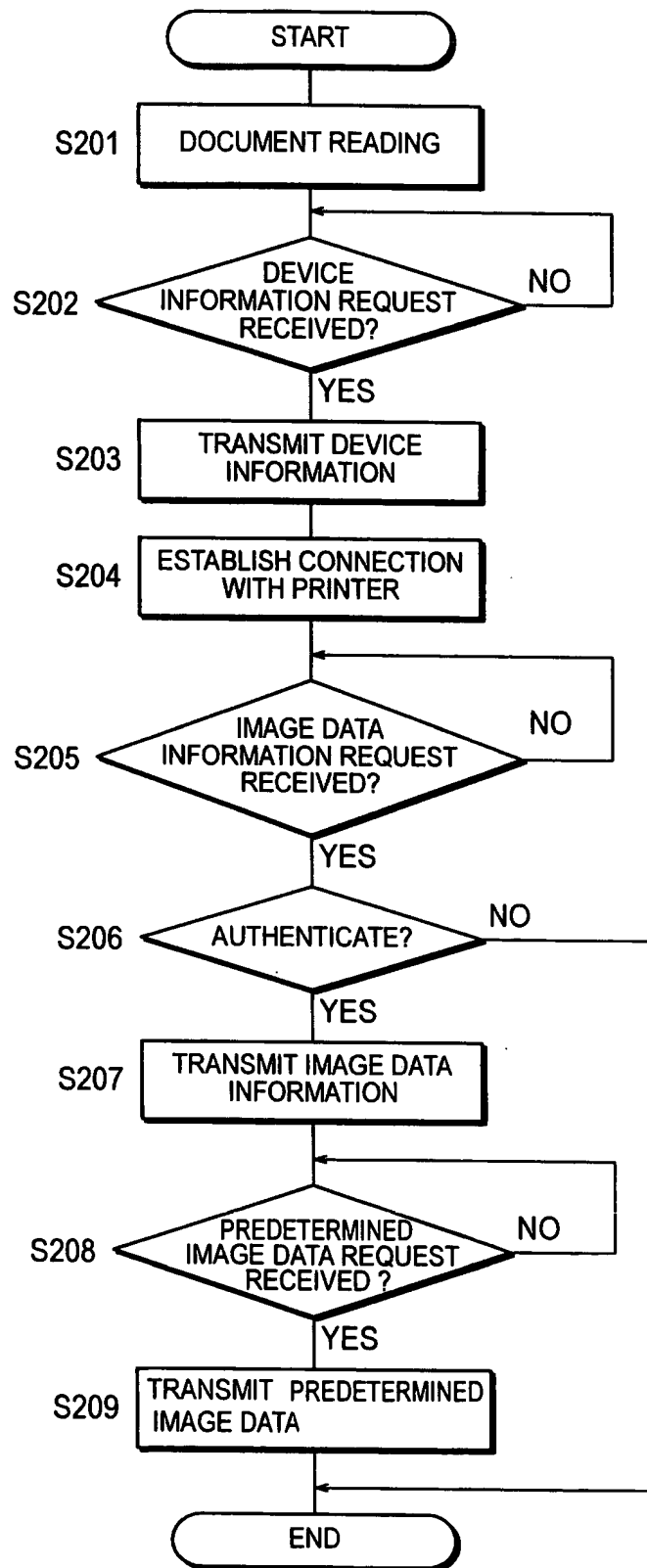
[Fig. 6]



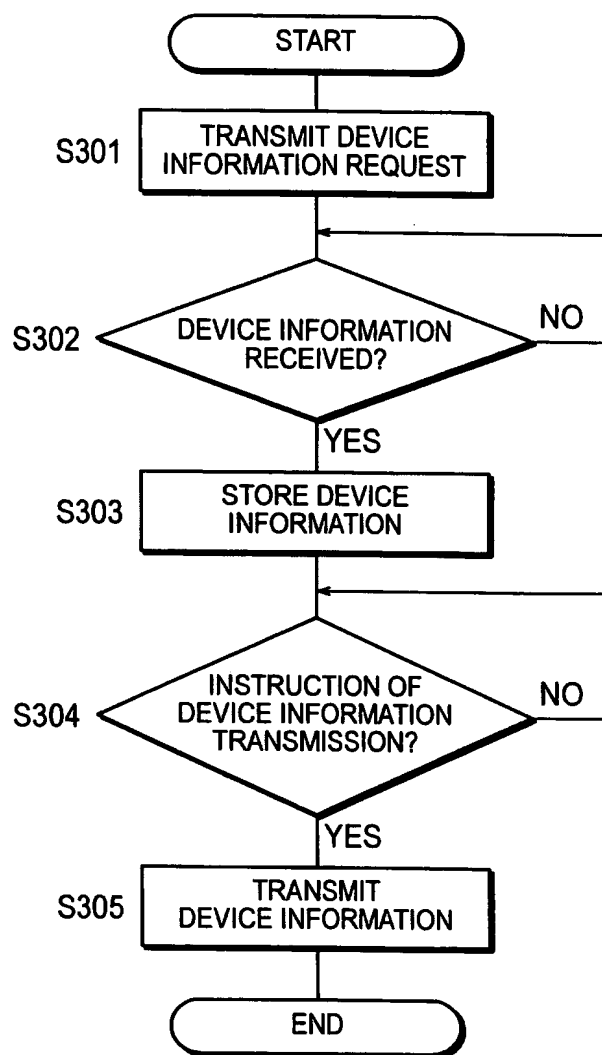
[Fig. 7]

DEVICE NAME	SCANNER 10
IP ADDRESS	100.100.100.100
LOGIN NAME	ABCDEF
PASSWORD	*****
DIRECTORY	PRINTER
.

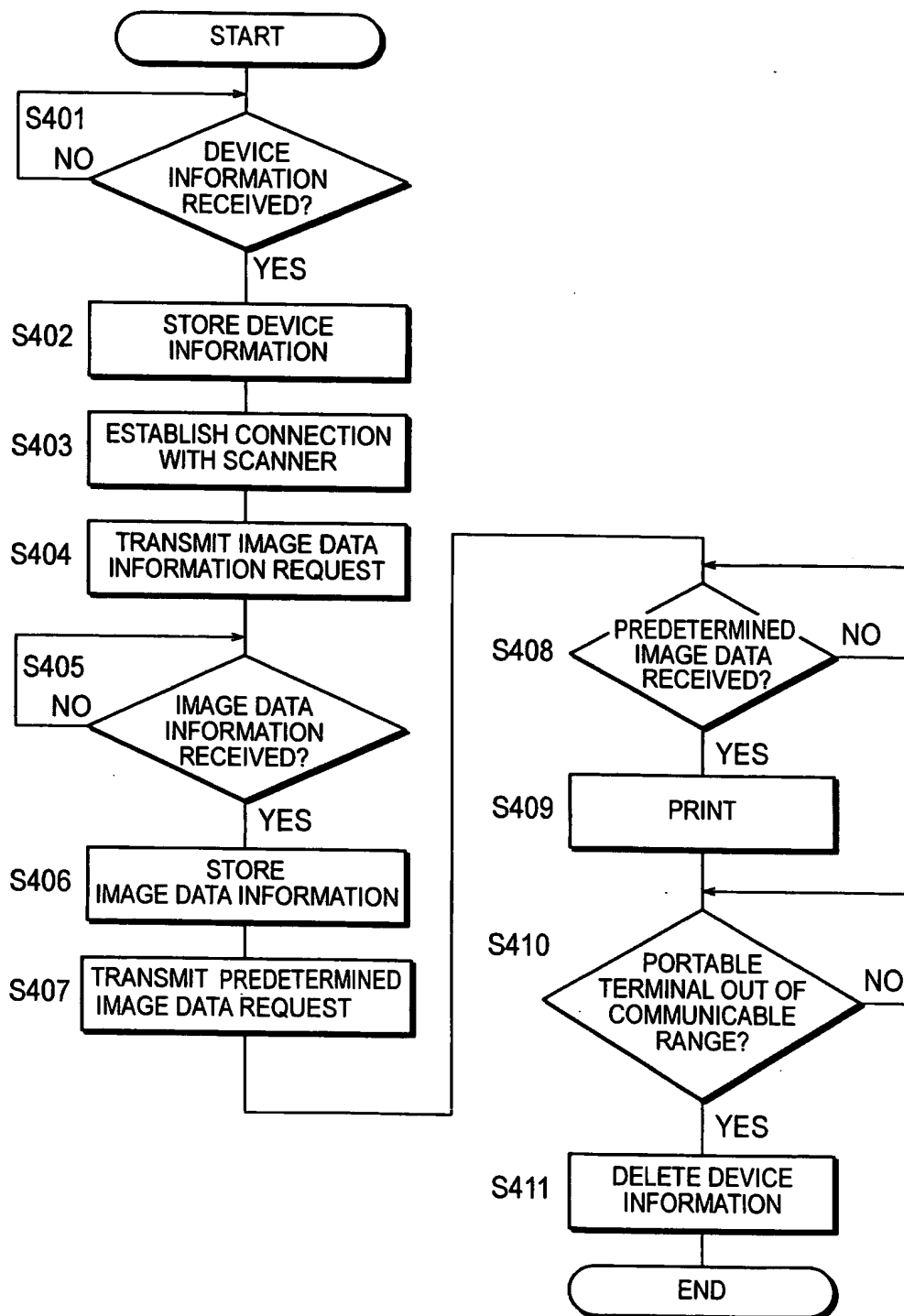
[Fig. 8]



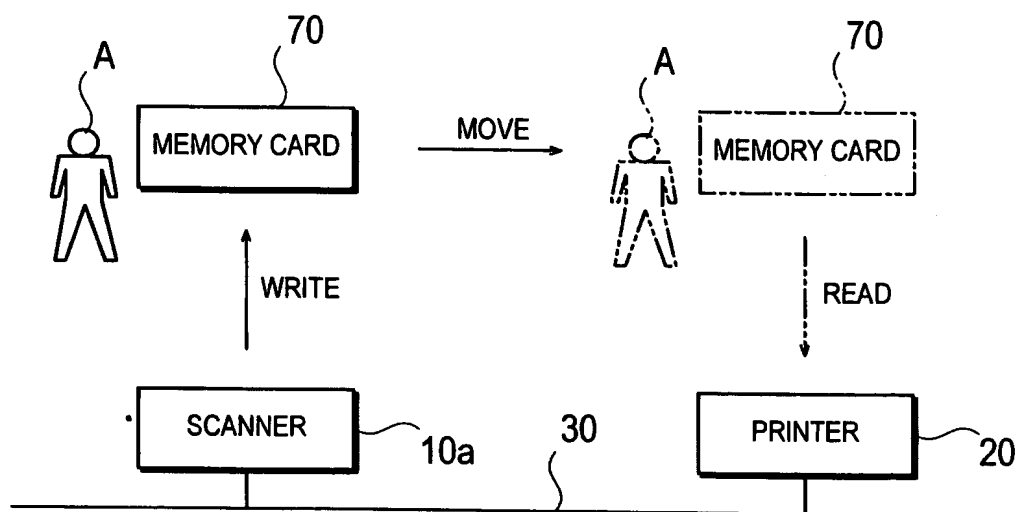
[Fig. 9]



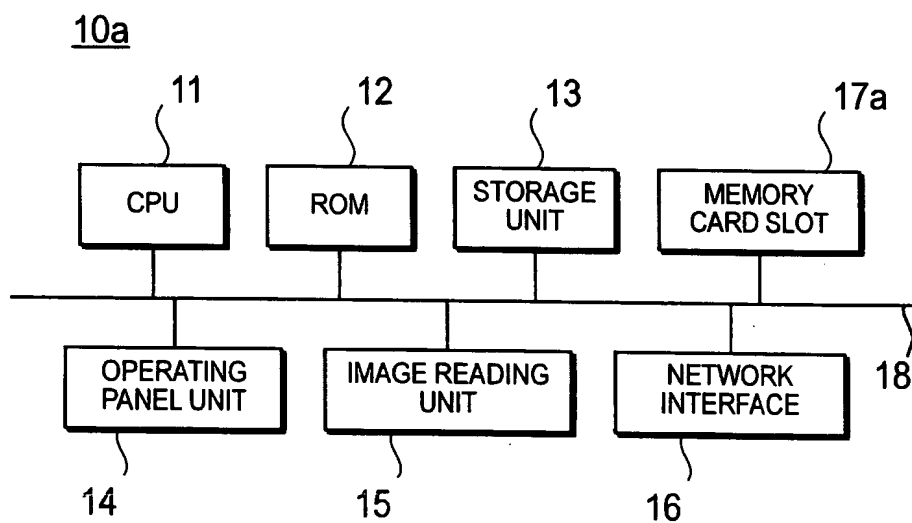
[Fig. 10]



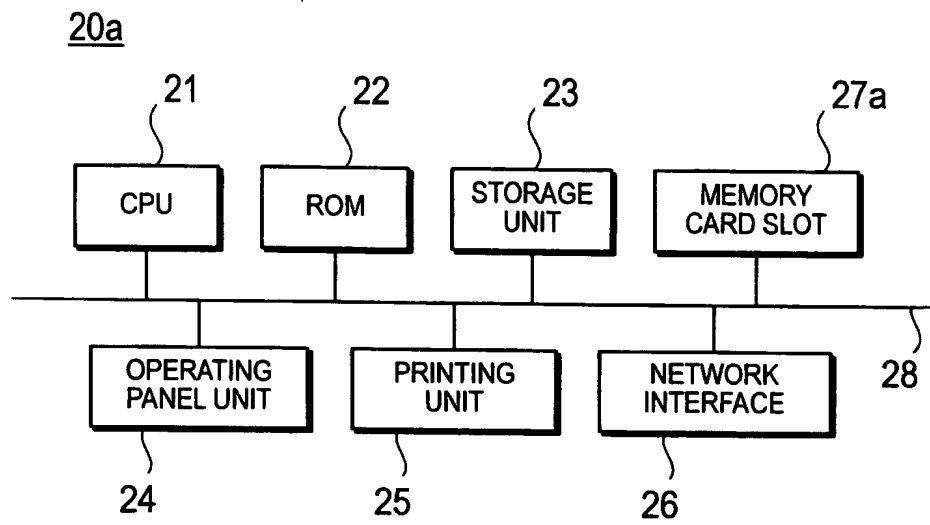
[Fig. 11]



[Fig. 12]



[Fig. 13]



[Fig. 14]

